

combination of regulatory requirements, namely: 1) unbundling wholesale rates, which cannot be increased above existing rate levels without prior CPUC approval; 2) a wholesale price cap, the specifics of which are yet to be determined; 3) possible adjustments to existing price caps; 4) the retention of rate band pricing guidelines with caps at existing rate levels; 5) retention of the requirement to submit cost-based showings for proposed rates which exceed current levels; and 6) the retention of market-based prices for the unbundled wholesale rate elements. See, Petition, pp. 81-2.⁴⁰

Although it is difficult to ascertain the specifics of the CPUC's future regulatory structure,⁴¹ GTE is certain that the continued regulation of cellular by the CPUC will continue to have a direct economic impact on carriers and cellular subscribers. Of the 25 states in which GTE provides cellular service, GTE's costs for complying with the CPUC's regulations is greater than the combined costs of complying with all other states' regulatory requirements.

⁴⁰ The CPUC leaves unstated what will happen to temporary and provisional tariffs, or rate of return regulation.

⁴¹ There exists a wholly separate issue, which GTE will not address in detail in the instant Comment, but which could make the CPUC's Petition moot. Specifically, the CPUC's stated intention to impose upon cellular carriers regulatory burdens which it neither fully evaluated nor implemented prior to June 1, 1993 may run afoul of the preemption provision of the OBR. Section 332 of the OBR permits states to continue rate regulation which was in effect prior to June 1, 1993. 47 U.S.C. §332(c)(3)(B).

The CPUC has imposed burdensome regulatory obligations on the cellular industry without having conducted an evaluation of competition within the cellular marketplace,⁴² and without producing any evidence of unjust and unreasonable rates and/or unjustly or unreasonably discriminatory rates for cellular service. The CPUC assumed the existence of an anti-competitive environment simply by virtue of the FCC's creation of a duopoly for the provision of cellular service. GTE respectfully submits that the FCC should not perpetuate the "crazy quilt" of regulations which the CPUC acknowledged its cellular regulatory framework resembles. OII, p. 14.

V. CONTINUED REGULATION BY THE CPUC WOULD RESULT IN THE PROMULGATION OF POLICIES WHICH DIRECTLY CONFLICT WITH NUMEROUS FCC POLICIES

Not only is the "condition" the CPUC wishes to eradicate non-existent, the "cure" undermines important FCC policies and goals. The CPUC would eviscerate the concept of regulatory parity by imposing disparate regulation upon carriers providing service which the FCC would classify as CMRS carriers. OII, p. 7 and n. 15. For example, wide-area SMR

⁴² Only 10 months ago the CPUC candidly observed that:

the Commission still must develop a method to measure whether rates are competitive and whether cellular markets are competitive. The need for an appropriate test still exists. The strategy for regulating cellular prices depends on accurate information on and measurement of the competitive nature of cellular prices.

OII, p. 10.

licensees will not be regulated by the CPUC as common carriers with respect to their provision of dispatch service, OII, n. 3, even though the FCC's recently-adopted rules governing CMRS require that such service, when offered indiscriminately, be classified as commercial, or common carrier, service. 2nd R&O, 9 FCC Rcd. at 1440-2. Further, the CPUC has derided the concept of a level playing field as a "red herring". OII, p. 17. Rather than treat all CMRS carriers equally, the CPUC, instead, proposes to impose a vastly streamlined regulatory framework on all wireless service providers, except cellular carriers.

The CPUC's regulatory framework also contradicts the FCC's resale policy. While the CPUC has historically employed protectionist regulations to benefit resellers,⁴³ e.g., the mandated wholesale/retail margin, the FCC has rejected similar protectionism. See, Petitions for Rule Making Concerning Proposed Changes to the Commission's Cellular Resale Policies, ("Resale Policies"), 6 FCC Rcd. 1719, 1724 (1991). Instead, in furtherance of the FCC's policy to promote full and fair competition in the marketplace, the FCC opted to prohibit discrimination against resellers. Cellular Communications Systems, 86 F.C.C. 2d at 510-511. Thus, resellers are not

⁴³ GTE notes that despite the CPUC's effort to assure California resellers a margin, according to the CPUC's statistics, resellers' market share continues to decline. GTE believes that one explanation for the resellers' lack of success has been the public's perception that resellers have not provided a unique service. See, Section III(B)(1), supra.

entitled to guaranteed profit margins but rather must engage in full blown competition with facilities-based carriers to attract subscribers. Resale Policies, 6 FCC Rcd. at 1726.

The preservation of the CPUC's regulatory authority over rates will also contravene the Commission's policy of permitting bundling of service and CPE. Bundling is not permitted by the CPUC. California is the only state in which GTE provides cellular service that prohibits bundling. In stark contrast to the CPUC, the Commission recognized in the Bundling of Cellular Customer Premises Equipment and Cellular Service ("Bundling Order"), 7 FCC Rcd. 4028 (1992) that subscribers could directly benefit, in the form of reduced prices for CPE, from the bundling of CPE and service. But for the state prohibition on bundling, California residents could be enjoying the benefits of bundling today.

As shown above, the imposition of unique state regulation in California also runs afoul of the FCC's and Congress's intent to have nationwide uniformity in regulation. H.R. No. 2264 Conf. Rep. No. 213, 103d Cong. 1st Sess. (1993), supra. With the increase in system interoperability and the development of regional and national interconnected cellular networks, the imposition of regulatory barriers in only some states encompassed by those networks results in the effects of those unique regulations being felt in a number of independent states, and could place cellular operators in California at a disadvantage with respect to other carriers in those networks.

VI. CONCLUSION

The CPUC's Petition should be dismissed or, in the alternative, denied. The CPUC has failed to make the strong evidentiary showing required by Section 20.13 of the Commission's Rules in order to justify the vesting of rate regulatory authority in any entity other than the FCC. The CPUC relies upon irrelevant and improperly-calculated figures which are utilized selectively and incorrectly to support an erroneous conclusion that the cellular marketplace is insufficiently competitive.

The CPUC's utilization of rate of return is misplaced, as the FCC has previously rejected the imposition of such regulation upon cellular carriers, and the CPUC has historically found that cost-based regulation is inappropriate with respect to cellular carriers. The Petition's hypothesis that cellular carriers reap huge rates of return as a result of charging monopoly rents is unsupported by any reliable evidence. Further, the Petition evidences no acknowledgement of the substantial capital investments made by cellular carriers to develop their networks and provide reliable cellular service to increasingly large areas and the introduction of new technology and features to the marketplace.

The rate trend evaluation is flawed. First, it ignores the benefits provided to subscribers by non-basic rates in the form of lower rates, increased free minutes of use and

additional standard calling features. Over time, there has been a substantial shift of the cellular subscriber base to non-basic plans. In fact, more than 85 percent of GTE's subscribers take service pursuant to such plans. Second, the CPUC analyzes nominal rate trends rather than the more accurate inflation-adjusted rate trends. An evaluation of inflation-adjusted rates over time would have revealed significant rate reductions in the best rate plans available at the 30, 160 and 250 minutes of use levels. Similarly, CPE prices also declined over this time.

The CPUC contends that its data, in conjunction with the lack of viable competitors in the marketplace, indicates that the cellular marketplace is less than competitive. The CPUC, however, construed too narrowly the criterion for substitutability. The Petition does not appropriately consider the impact upon competition in the cellular marketplace of either currently available paging and SMR services or of the introduction of PCS and wide-area SMR providers.

Retention of state jurisdiction over cellular service rates in California would carry with it several certainties: 1) the regulatory framework described by the CPUC as a "crazy quilt" will be retained; 2) the CPUC's major cellular regulatory initiative -- the stimulation of cellular resale -- would be retained even though it has not been successful; and 3) several of the state regulatory policies which would be

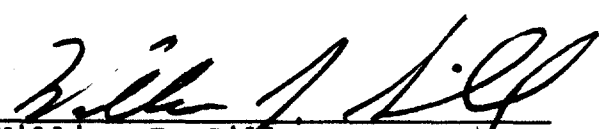
preserved would conflict with FCC policies. Two examples of CPUC policies which are at odds with FCC policies are: 1) the CPUC's disparagement of the concept of parity as a "red herring"; and 2) its prohibition on the bundling of services and rates. The Petition admits that the resale policy has been ineffective, as the CPUC reports that despite its efforts to assure resellers a guaranteed margin, resellers' market share continues to decline. Whereas the expected response from the CPUC may be more regulation, GTE respectfully submits the appropriate response would be less regulation so that competition could flourish in the wireless marketplace.

WHEREFORE, for the foregoing reasons, GTE respectfully requests that the Petition of the CPUC be dismissed or, in the alternative, denied.

Respectfully submitted,

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ATTACHMENT A

CONCENTRATION, COMPETITION, AND PERFORMANCE IN THE MOBILE
TELECOMMUNICATIONS SERVICES MARKET

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September 9, 1994



EXECUTIVE SUMMARY

This paper examines both the performance of the mobile telecommunications services industry during its first decade and the impact of changes in industry structure and capacity that will occur in the next. It concludes that the performance of the cellular industry has been consistent with what would be expected in a competitive market and that industry concentration will decrease greatly with the advent of the use of PCS and ESMR technologies. The effect of these developments is to reduce further the need for new regulations of cellular services. The entry of new firms and the introduction of new capacity promise soon to do effectively what regulation can do only highly imperfectly -- reduce the prices and improve the service offerings that are available to mobile service consumers.

INTRODUCTION

In a series of decisions extending over a number of years, the Federal Communications Commission has demonstrated an increasing recognition that the market for mobile telecommunications services is broad and growing, and that its regulation warrants a flexible approach. In its 1981 Report and Order authorizing cellular communications systems on a commercial basis, the Commission concluded that licensing two cellular carriers in each service area would best serve the public interest, convenience, and necessity. In establishing this duopoly structure, the FCC sought to balance the benefits arising from economies of scale with those resulting

from competition.¹ Subsequently, the Commission determined that it should license additional spectrum to the two cellular carriers as the services they offered proved highly popular with users.²

More recently, in its various Personal Communications Services (PCS) orders, the Commission has expanded on its flexible approach to the regulation of mobile telecommunications services.³ First, it has allocated a substantial amount of additional spectrum for the provision of these services, further expanding the resources that are available for their provision. Second, it plans to auction a number of large spectrum blocks, and will permit subsequent combinations of blocks, to permit economies of scale in the provision of mobile services to be exploited. Third, while recognizing the importance of these scale economies, in order to limit industry concentration, the Commission has constrained both the amount of PCS spectrum that can be licensed to any single entity in a given geographic area and the amount of spectrum that can be licensed to cellular incumbents in either the PCS auctions

¹Report and Order in the Matter of an Inquiry into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems; and Amendments of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems, CC Docket No. 79-318, adopted April 9, 1981; 86 FCC 2nd 469 (1981). Only seven years before, noting the technical complexity and expense of cellular systems, together with the large amount of spectrum required for their economic viability, the FCC had concluded that only one cellular system should be licensed in each service area (Second Report and Order in Docket No. 18262, 46 FCC 2nd 752 (1974)).

²Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems, 2 FCC Rcd 1825 (1986).

³See, e.g., Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, Adopted September 23, 1993.

or the aftermarket.

Finally, and perhaps most importantly, by broadly defining PCS as "a family of mobile or portable radio communications services which could provide services to individuals and business, and be integrated with a variety of competing networks,"⁴ the Commission has chosen to give substantial latitude to operators to offer a wide range of services under the PCS rubric. Thus, if some mobile services prove popular, and thus profitable to provide, PCS operators will be able to offer these services without seeking regulatory approval to do so.⁵

The flexibility being afforded to PCS operators, which will permit them to offer either "traditional" cellular telephone service or newer value-added services, is especially appropriate in view of the significant uncertainty about precisely which mobile telecommunications services consumers will desire. At present, PCS remains a somewhat vaguely defined term, with a wide range of interpretations. Some have described PCS as the third phase in the

⁴Notice of Proposed Rule Making and Tentative Decision, In the Matter of Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, ET Docket No. 92-100, released August 14, 1992, para. 29 (hereinafter "Notice").

⁵The Commission has also granted flexibility to cellular incumbents to offer PCS-like services in Report and Order In the Matter of Liberalization of Technology and Auxiliary Service Offerings in Domestic Public Cellular Radio Telecommunications Service, 3 FCC Rcd 7033 (1988); Memorandum Opinion and Order In the Matter of Liberalization of Technology and Auxiliary Service Offerings in Domestic Public Cellular Radio Telecommunications Service, 5 FCC Rcd 1138 (1990); and Second Report and Order In the Matter of Amendment of the Commission's Rules to Establish New Personal Communications Services, 8 FCC Rcd 7700 (1993).

evolution of cellular technology, following service to automobiles and portable telephones. A second view has PCS comprising several varieties of digital communications technologies slated to become competitive alternatives to cellular services -- for example, CT-2 (second-generation cordless telephones) or Enhanced Specialized Mobile Radio (ESMR). A third view is that PCS is simply a synonym for wireless or mobile telecommunications services, one of which is cellular radio. Finally, perhaps the most amorphous characterization of PCS is "more spectrum for something else," that is, any and every new wireless concept that is proposed.⁶

While providers of cellular telephone services now offer a number of value-added services, including voice mail, call waiting, call forwarding, portable facsimile, and wireless transmission for laptop computers, PCS firms will be able to supplement these services by providing similar communications opportunities for customers in a host of possible environments (e.g., inbuilding, neighborhood, pedestrian), using various registration modes ("home," "roam"), and an array of voice or data instruments offering a range of integrated enhanced services.⁷

⁶See G. Calhoun, Wireless Access and the Local Telephone Network (Boston: Artech House, 1992), p. 573.

⁷Telocator lists 18 "Existing PCSs" and 5 "Emerging PCSs." Yet even these numbers understate the array of available service options, since there are many variations of each service. The FCC has authorized over 150 PCS experimental licenses in the past few years. Other possible offerings include advanced digital cordless phone service, wireless private branch exchange (PBX), wireless local area networks (LANs), wireless data transfer and advanced paging, high-speed local-area data communications services connecting personal computers ("Data-PCS"), and wireless local loop service; see the Notice, paragraphs 9, 10, and 18.

The term "cellular radio/telephone" was initially restricted to describing in-vehicle ("mobile") communications while "PCS" has often been used to describe handheld ("portable") communication devices. However, because the firms that will employ these technologies can compete to provide the same services -- cellular operators currently offer portable services while PCS suppliers are expected to offer mobile services -- they are all in the mobile telecommunications services market. Thus, whatever particular services are eventually offered by PCS and cellular providers, the introduction of PCS will increase both the amount of spectrum available to supply mobile services and the number of different firms that furnish these services.

PERFORMANCE IN THE PROVISION OF CELLULAR SERVICE

From its beginning, the business of supplying mobile telecommunications services using cellular technologies has been characterized by rapidly increasing volume, declining real prices, expanded service offerings, growing capacity, and significant technological change. In December 1984, there were fewer than 100,000 cellular subscribers in the United States with average monthly expenditures on cellular service of almost \$500. The cumulative capital investment in the industry was then about \$450 million and there were about 1,400 cell sites. Less than ten years later, in December 1993, there were more than 16 million cellular subscribers, average monthly expenditures were about \$60, the industry was investing at a rate of more than \$2.5 billion per

year, and there were almost 40,000 cell sites.⁸ In addition, innovations in analog technologies (e.g., adjusted power input, antenna tilting, dynamic channel assignment) have enabled cellular operators to expand their capacity, while even more dramatic advances are expected from the further development and application of digital technologies.

By any measure -- subscribers, capital investment, cell sites -- the growth of the cellular industry has been spectacular during the first decade of its existence. Annual growth rates have been 77 percent for subscribers, 49 percent for cell sites, and 48 percent for capital investment over the period since 1984.⁹ And the rates of growth of these indicators continue to be exceptionally strong. Between December 1992 and December 1993, the number of cellular subscribers increased almost 50 percent, cumulative capital investment grew by 22 percent, and the number of cell sites grew by more than ten percent.

Contributing to the increasing number of subscribers and the accompanying increase in the volume of use has been a steady decline in the costs of owning and using cellular telephones. For example, the real, i.e., inflation-adjusted, unweighted average of

⁸ The data on which these figures are based are from the Cellular Telecommunications Industry Association End-of-Year Data Survey. Revenue and capital investment data have been converted to 1993 dollars using the CPI All Services index for revenues and the PPI Capital Equipment index for capital investments. Average monthly expenditures are calculated as six-month revenues divided by 6 divided by the number of subscribers at the end of the period. Because subscribership is growing, this tends to understate the average subscriber bill during any period.

⁹Op. cit.

the lowest published rate for access and 250 minutes of usage during prime time in the ten largest cellular service areas in 1991 was only 62 percent of its 1983 level.¹⁰ Similarly, the average of the lowest real price for the purchase of 150 minutes of airtime in the top 30 markets declined by 27 percent between January 1985 and January 1991.¹¹

The same general pattern of declining real prices can be observed for cellular systems owned or controlled by GTE Corporation.¹² The unweighted average of the lowest real prices for systems in the top 100 MSAs in which Contel Cellular, Inc. had at least a 90 percent ownership interest declined by more than 20 percent between 1989 and 1993 for 30, 160, and 250 minutes of monthly use.¹³ For GTE Mobilnet Incorporated systems, although the unweighted average of the lowest real prices for 30 minutes of monthly use were essentially unchanged between 1989 and 1993, average rates for 160 and 250 minutes declined by 18 and 19 percent, respectively.¹⁴

¹⁰Data are from Herschel Shosteck Associates, Ltd., Cellular Market Forecasts, Data Flash, September 1992.

¹¹General Accounting Office, Concerns About Competition in the Cellular Telephone Service Industry, GAO/RCED-92-220, 1992, p. 22.

¹²GTE Corporation is the parent company of both GTE Mobilnet Incorporated ("GTEM") and Contel Corporation ("Contel"). GTEM and Contel have numerous cellular subsidiaries.

¹³The calculations assume 80 percent peak and 20 percent off-peak usage.

¹⁴Collection of the underlying data and computation of the unweighted averages were performed by GTE. Inflation adjustments were performed using the CPI.

On an industry-wide basis, the monthly cost of a mobile cellular telephone has declined by even more than carrier charges, from \$79 in 1983 to \$7 in 1991. During the same time, the quality of mobile telephone service was enhanced by improvements in functions and features. When adjusted for inflation, the total cost of owning and using a cellular telephone in 1991 was only 44 percent of its cost in 1983.¹⁵

It is important to recognize that the growth in subscribership and the reduction in prices have occurred in an industry in which only two firms were licensed to serve each geographic area and the amount of spectrum available to provide cellular service was severely limited by government regulation. However, the industry is about to experience a significant increase both in the number of firms that supply mobile communications services and in the amount of spectrum that has been allocated for this purpose. At least three, and perhaps as many as six, new PCS firms will operate in each geographic area, and the amount of spectrum available for the provision of mobile services will more than triple.

Moreover, even this understates the amount of additional capacity that will be available to serve subscribers since the new operators will use digital technologies that are more efficient than the analog technologies that have been used by incumbent

¹⁵Data are from Shosteck, op. cit., and measure the "drive away" price of a single mobile telephone, including antenna, installation, and first-year maintenance.

cellular operators.¹⁶ To this must be added the effect of the introduction of Enhanced Specialized Mobile Radio (ESMR) in the near term and satellite mobile service somewhat later, both of which will add further to the number of firms providing mobile services and the amount of spectrum devoted to this purpose. By any standard, industry concentration will decline greatly -- the question is how soon and by how much -- and limitations on industry growth that have resulted from government-imposed limits on available spectrum will be greatly relaxed.

COMPETITION IN CELLULAR SERVICE

Although, at first glance, the predominantly duopolistic structure of the current mobile telecommunications market might tend to raise anticompetitive concerns, the realities of the market dynamics outlined above support the view that there has been substantial competition between the two cellular operators. In seeing how such a result may come about, one must first recognize that the performance of a market can be competitive even when its structure is not. Although economists consider the number and size distribution of firms in a market to be important initial indicators of the likelihood of noncompetitive behavior,¹⁷ a number of characteristics of the supply of cellular services

¹⁶Of course, the incumbents are also converting to digital technologies, but the pace at which they can do so is limited by their continuing obligation to provide service to customers with analog equipment.

¹⁷M. Spence, "Tacit Co-ordination and Imperfect Information," Canadian Journal of Economics XI (1978), pp. 497 and 499.

support the view that competition between cellular operators is substantially more vigorous than is suggested by the duopolistic industry structure.

Economists have identified a number of factors, in addition to the number of its rivals, that influence the strategies each firm pursues, and thus help to determine how close to the competitive outcome the industry's performance will be.¹⁸ Many of these encourage highly competitive behavior even when the number of firms is small, and several of these factors are present in the cellular service industry.¹⁹

First, the rapid technological change in the provision of cellular service imparts a high degree of variability to the services offered and the prices of those services. When firms are continually modifying, improving, and adding new products and services, the price of each new service must be integrated into the existing price structure. In these circumstances, there may be significant disagreement about the "appropriate" prices to charge for the new services because it is difficult for rivals to

¹⁸G. J. Stigler, "A Theory of Oligopoly," Journal of Political Economy 74 (1964), pp. 44-61.

¹⁹For a more extended discussion of these factors as they apply to the mobile telecommunications services market, see S.M. Besen, R.J. Lerner, and E.J. Murdoch, The Cellular Service Industry: Performance and Competition, Appendix to Reply Comments of the Cellular Telecommunications Industry Association In the Matter of Amendment of the Commission's Rules to Establish New Personal Communications Services, January 1993.

determine what these prices are.²⁰

Second, when markets are growing rapidly, the elasticity of demand tends to decline. In such circumstances, which certainly characterize the provision of cellular services, the gains from deviating from a collusive pricing agreement are increased.²¹

Third, with rapid technological innovation, there may be gains to pricing aggressively. These gains arise because a firm can achieve cost savings more rapidly as it moves more quickly down its learning curve, and firms may have difficulty coordinating the rate at which they acquire these learning economies.²²

Fourth, newcomers in an industry have strong incentives to compete aggressively to attract market shares from existing firms. Early in the history of cellular services, when the wireline carriers already were established and the nonwireline carriers were just beginning to serve customers, the new providers had an especially strong incentive to initiate price reductions. Similarly, aggressive pricing can be expected from PCS entrants as they seek to increase their shares of the mobile services market.

²⁰Rapid technological change may itself be a source of conflict. As Scherer and Ross note: "The more rapidly producers' cost functions are altered through technical change and the more unevenly those changes are diffused throughout the industry, the more likely there will be conflict regarding pricing choices." F.M. Scherer and D. Ross, Industrial Market Structure and Economic Performance, Third Edition (Boston: Houghton Mifflin, 1990), p. 285.

²¹J.J. Rotemberg and G. Saloner, "A Supergame-Theoretic Model of Price Wars During Booms," American Economic Review 76 (1986), pp. 390-407.

²²A.M. Spence, "The Learning Curve and Competition," The Bell Journal of Economics 12 (1981), pp. 49-70.

Fifth, collusive behavior is generally believed to occur much less frequently in industries, like mobile telecommunications services, in which a significant portion of a firm's costs must be incurred regardless of the level of its output, i.e., when fixed costs are high relative to variable costs.²³ In such circumstances, there are considerable incentives for firms to reduce prices if demand falls short of capacity. Since much investment is both expected, and will have to be made, in anticipation of sizeable demand growth, there are likely to be many situations in which some firms will have substantial excess capacity, precisely the circumstances in which economic analysis indicates that vigorous price competition will prevail.²⁴

Finally, although the quality of airtime may not vary significantly across providers, an array of service packages is typically offered. These packages differ by whether or not they include equipment, in the nature of the peak-off peak pricing differentials they contain, and in the discount arrangements, e.g., free weekend service, they provide, among other features. As a result, these packages may not be directly comparable between competing providers.²⁵ The lack of an obvious basis for comparing

²³Scherer and Ross, op. cit., pp. 286-290, discuss the effects of such a cost structure.

²⁴It is important to note that excess capacity as defined here in economic terms may differ from engineering estimates of excess capacity.

²⁵The quality of airtime will vary from time to time, however, if cellular providers fail to anticipate the growth in subscribers, leading to increased traffic congestion.

service and equipment prices -- which makes it difficult to distinguish price changes that reflect differences in service quality from those that undercut a tacit agreement -- increases the cost of monitoring and punishing deviations from any such agreement.²⁶

The combined effect of these factors is to make it difficult for cellular firms to coordinate their pricing behavior. As a result, it would be a mistake to conclude that cellular firms do not compete.

PCS, ESMR, AND CHANGES IN MARKET STRUCTURE

It is important to recognize that the advent of PCS will have two logically separable effects on the mobile telecommunications services market. First, it will substantially increase the number of firms and reduce the market shares of the incumbent cellular firms. Second, it will increase the capacity of the industry by adding 120 MHz of spectrum to the 50 MHz now employed by the incumbents. One would generally expect prices to decline as a result of the increase in spectrum availability whether or not the incumbent firms are behaving competitively. The proper test for determining the extent of current competition is to ask how prices would change if the existing amount of spectrum were divided among a larger number of firms.

The structure of the mobile telecommunications services

²⁶K.W. Clarkson and R.L. Miller, Industrial Organization: Theory, Evidence, and Public Policy (New York, NY: McGraw-Hill Book Company, 1982), pp. 335-336.

industry will become substantially less concentrated with the advent of PCS services, and competition will become even more vigorous. Given the wide range of mobile telecommunications services, the best approach to developing a market definition is from the supply side.²⁷ Because there is substantial supply-side substitutability, so that all mobile telecommunications licensees - including those providing cellular, PCS, and Specialized Mobile Radio services -- can provide the same range of services, they should all be considered as being in the same antitrust market.²⁸ In these circumstances, the capacity of each firm to transmit information over its licensed bandwidth, without regard to the uses to which that bandwidth is put, is the correct measure of firm shares, and market concentration can be measured using these

²⁷Market definition generally follows the approach in the "Department of Justice and Federal Trade Commission Horizontal Merger Guidelines," Special Supplement, Antitrust & Trade Regulation Report, Published and Released on April 2, 1992. A market is defined as "a product or group of products such that a hypothetical profit-maximizing firm that was the only present and future seller of those products ('monopolist') likely would impose at least a 'small but significant and nontransitory' increase in price." If such a hypothetical monopolist would not find the price increase to be profitable, "then the Agency will add to the product group the product that is the next-best substitute....The Agency generally will consider the relevant product market to be the smallest group of products that satisfies the ['small but significant and nontransitory' increase in price] test." Market definition has both product and geographic dimensions.

²⁸For a more extended discussion of the principles of market definition and their application to the mobile telecommunications services market, see S.M. Besen and W.B. Burnett, "An Antitrust Analysis of the Market for Mobile Telecommunications Services," Appendix A to Petition for Reconsideration of the Cellular Telecommunications Industry Association In the Matter of Amendment of the Commission's Rules to Establish New Personal Communications Services, December 8, 1993.

shares.²⁹

The key to this conclusion is that providers are legally able to shift or substitute rapidly among the various services available for provision, and can do so at modest cost. If all firms can easily offer the same range of services, they are in the same market.

A number of factors support the view that all mobile service providers -- cellular, PCS, and ESMR -- are in the same market:³⁰

(1) the absence of legal or regulatory restrictions on spectrum use, permitting a licensee to shift from provision of one mobile service to another in response to a service price increase; (2) the ability to use all portions of the electromagnetic spectrum allocated to the provision of mobile services to provide all of the same services and at similar costs ("bandwidth fungibility"); (3) the ability of suppliers to obtain equipment that can be used to provide more than one service, a factor that will be enhanced by the introduction of Cellular Digital Packet Data (CDPD) modules; and (4) the ability of consumers to obtain equipment that can be used to obtain service from suppliers using different frequencies, a factor that is enhanced by the FCC's decision to consolidate PCS assignments in a continuous band.

²⁹It must be noted that there is not a one-to-one correspondence between bandwidth and capacity. The capacity to transmit information is a function both of bandwidth and the technology used; analog technologies are inherently less capable than digital technologies. Capacity is based on effective bandwidth.

³⁰Besen and Burnett, op. cit., discusses these factors in more detail.

After the market is defined, shares must then be assigned to each supplier in order to measure market concentration. As mentioned above, effective capacity to transmit information is the appropriate measure of market shares within the market for mobile telecommunications services, particularly given the ease with which firms may switch from the provision of one service to another.³¹ The decision by the Commission to award licenses to PCS providers, combined with the introduction of ESMR, will greatly expand the number of firms supplying mobile telecommunications services in each geographic area within the United States and will dramatically reduce the level of market concentration.

Measuring the magnitude of the change can be demonstrated by comparing the current Herfindahl-Hirschman Index (HHI), the sum of the squared market shares of the incumbent cellular operators, with the HHI that will prevail after the introduction of PCS and ESMR.³² The current HHI is 5000, since each of the incumbents has

³¹Within a given allotment of spectrum, newer, digital systems have a far greater capacity than do older, analog ones. Because incumbent cellular operators will, for some time, be required to continue to serve customers that have invested in analog equipment, they will have lower effective capacity and market share per unit of allocated bandwidth than will firms with licenses for the same amount of bandwidth that employ only digital equipment. Existing cellular operators will suffer this "analog handicap" for as long as they must serve customers using the old technology. The share of the mobile telecommunications market held by cellular firms will be less than their share of assigned bandwidth, and this factor must be taken into account in measuring market concentration and the effects of spectrum license acquisitions.

³²The HHI is the most widely used measure of market concentration and appears prominently in the DOJ/FTC Horizontal Merger Guidelines.